

HYDROFLUOROSILICIC ACID

I. TECHNICAL REQUIREMENTS:

A. DESCRIPTION: The fluoride compound furnished under this specification shall be Hydrofluorosilicic Acid. The acid shall be an aqueous solution that is "straw yellow" in color. The Hydrofluorosilicic Acid shall be suitable for addition to treated drinking water in order to reduce the incidence of dental caries.

B. STANDARDS:

- 1) Hydrofluorosilicic acid furnished under this specification shall conform to the latest ANSI/AWWA Standard B703-06 and the following requirements.
- 2) The hydrofluorosilicic acid supplied shall be tested and certified as meeting the specifications of the American National Standards Institute/National Sanitation Foundation Standard 60 (ANSI/NSF Standard 60) Drinking Water Treatment Chemical-Health Effects. **Documentation of ANSI/NSF certification shall be furnished with the bid.**
- 3) The Vendor shall provide analytical test results certifying that the hydrofluorosilicic acid being supplied meets the above specification with the bid. **Verification of hydrofluorosilicic acid quality will be determined by laboratory testing on at least a quarterly basis with documentation to be provided to the City of Milwaukee Water Works.** If the supplier changes source of hydrofluorosilicic acid during any quarter year increment, a new certification will be required.
- 4) **If bidder is not the supplier, the bidder must provide the manufacturer/suppliers name and product number with the bid. All suppliers must meet the bid and specification requirements.**
- 5) **A Material Safety Data Sheet (MSDS) must accompany the bid and be included with each shipment.**
- 6) The vendor shall have the capability to produce and distribute approved product from multiple locations to ensure uninterrupted supply in the event of a plant shutdown or other disruption in manufacturing or distribution. **Documentation of the supplier's multiple approved locations shall be furnished with the bid.**
- 7) HYDROFLUOROSILICIC ACID:
 - (a) The hydrofluorosilicic acid shall meet the following chemical and physical compositions:

1. H ₂ SiF ₆	minimum 23% by wt
2. Arsenic	25.0 mg/L max
3. Antimony	1.0 mg/L max
4. Barium	5.0 mg/L max
5. Beryllium	1.0 mg/L max
6. Cadmium	1.0 mg/L max
7. Chromium	1.0 mg/L max
8. Copper	5.0 mg/L max
9. Iron	50 mg/L max
10. Lead	1 mg/L max
11. Mercury	0.2 mg/L max
12. Nickel	1.0 mg/L max
13. Nitrate	1.0 mg/L max as (NO ₃)
14. Selenium	1.0 mg/L max
15. Zinc	5.0 mg/L max
16. Water Insoluble	0.01 per cent by wt.
17. Specific Gravity @ 17.5°C	1.15 to 1.25 (range)

18. Color	Clear to straw yellow
19. Odor	No objectionable odor
20. Clarity	Clear
21. Freezing Point	-25 to -41 F° Fahrenheit

- (b) The Hydrofluorosilicic Acid shall be clean and free of impurities injurious to water quality or that cause failure to meet any regulations.
 - (c) There shall not be more than 0.020 percent by weight of heavy metals in the acid furnished expressed as lead (Pb).
 - (d) The Hydrofluorosilicic Acid shall contain a minimum of 23 percent H_2SiF_6 by weight.
 - (e) The specific gravity of the acid solution shall be 1.20 ± 0.05 at 17.5°C (Centigrade).
 - (f) The Hydrofluorosilicic Acid shall be clean and free of suspended matter.
 - (g) The Hydrofluoric Acid content shall not exceed 1.0 percent by weight.
 - (h) The Hydrofluorosilicic Acid shall have the appearance of clear tap water with no visible particles.
 - (i) The Hydrofluorosilicic Acid shall not have an abnormal or objectionable odor.
 - (j) The Hydrofluorosilicic Acid shall not impart any taste or odor to the water treatment processes.
 - (k) The chemical-dealer shall comply with all Wisconsin Occupational Safety and Health Act requirements, where applicable and in effect at the time of delivery.
 - (l) The chemical shall meet the approval for the treatment process for drinking/potable water by the Wisconsin Department of Natural Resources.
- B) **SHIPMENT:** Liquid Hydrofluorosilicic Acid shall be shipped in bulk acid resistant lined tank trucks with tight closures to avoid contamination. Shipping shall conform to current U.S. Department of Transportation and intrastate regulations. The tanker truck shall be constructed, inspected, cleaned, maintained, and loaded in strict accordance with the latest American National Standards Institute K61.1- 81 requirements for the Storage and Handling of Hydrofluorosilicic Acid. The contractor shall furnish certified weight tickets to the purchaser upon delivery. The Hydrofluorosilicic Acid shall be packed and shipped to comply with current hazardous materials regulations of the Department of Transportation and Applicable Intrastate Requirements.
- 1) The Vendor shall make deliveries of Hydrofluorosilicic Acid between the hours of 7:00 a.m. and 2:30 p.m., Monday through Friday. If the vendor, for any reason, cannot make the delivery during the stated hours, the Vendor shall notify the City and an alternate time may be arranged at the discretion of the City. Vendor shall make deliveries within 5 days of request by City.
 - 2) All cargo trailers and appurtenant valves used for the delivery of the Hydrofluorosilicic Acid under this agreement shall be in good mechanical order, and shall be in full compliance with the applicable requirements of the Hazardous Materials; regulations of the Department of Transportation, Code of Federal regulations, as currently issued.
 - 3) **Vendor shall supply a “Certificate of Washout” for each bulk shipment of water treatment chemical, unless the Vendor verifies in writing that all bulk shipments are supplied & transported in dedicated tankers that are used solely & exclusively to transport the specific chemical supplied. The “Certificate of Washout: for each bulk shipment contain at a minimum:**

- i. Date of wash
- ii. Tanker/trailer number

- iii. Material last transported
- iv. Type of wash
- v. Initials/sign off by Vendor Representative

C) SPILLAGE

- 1) The Vendor shall provide equipment and training of truck drivers to minimize the chance of spillage during connection and disconnection of hoses, and during the transfer of chemical.
- 2) In the event of leakage or spillage during unloading, it shall be the Vendor's responsibility to effect immediate containment, cleanup, disposal, and restoration activities in accordance with applicable laws and regulations and subject to the City's satisfaction. All material associated with such cleanup operations such, as spent absorbent, shall be removed by the Vendor.
- 3) The Vendor shall be notified promptly of any spillage during unloading, which, in the opinion of the city, is inadequately cleaned up by the Vendor's personnel. Any spillage during unloading inadequately cleaned up within four (4) hours of notification that requires immediate cleanup exceeding the abilities/equipment of the driver will be cleaned up by the City. The Vendor shall be responsible for reimbursing the City for the costs incurred, including fines or penalties, which may be imposed by regulating authorities.
- 4) All appurtenant valves, pumps, and discharge hoses used for the delivery of Hydrofluorosilicic Acid shall be clean and free from contaminating material. If off-loading equipment is not properly cleaned, this will constitute a reason for rejection of the load.

D) DELIVERY

- 1) The Hydrofluorosilicic Acid shall be delivered from bulk storage trucks to the locations listed below:

Linnwood Water Purification Plant
3000 North Lincoln Memorial Drive
Milwaukee, WI 53211-3462

Howard Avenue Water Purification Plant
3929 South 6th Street
Milwaukee, WI 53221

- 2) Each site is equipped with Hydrofluorosilicic Acid storage vessels owned by the City of Milwaukee Water Works with following specifications:

<u>Tank Specifications</u>	<u>Linnwood</u>	<u>Howard Ave.</u>
Type	rubber lined pressurized metal tank	fiberglass lined
Number @ each site	1	2
Nominal capacity (gallons)	8,200	10,350

- 3) The minimum delivery of bulk Hydrofluorosilicic Acid to either plant will be 40,000 pounds.
- 4) The Vendor will provide a billing of lading, certificate of analysis, and a certificate of washout at the time of delivery.
- 5) The supplier of Hydrofluorosilicic Acid shall make the required delivery to the respective plant within 5 days of placement of the order.
- 6) Within 24 hours on the day of delivery, the chemical Vendor shall provide the necessary information to the water plant placing the order. (See attached "Delivery Information" form) Any incorrect

information or failure to meet this requirement will delay or deny plant access.

- 7) The Driver delivering the product will have to present a valid photo identification to Milwaukee Water Works designated security agent at the time of delivery before access to the plant will be granted.
- 8) Those deliveries that do not meet these requirements will not be allowed onto the plant grounds and will be sufficient cause for rejection of the load.

E) ESTIMATED QUANTITIES:

- 1) The following quantities of Hydrofluorosilicic Acid are estimated:

<u>Plant</u>	<u>Average Daily Usage (as liquid H₂SiF₆)</u>
Linnwood Plant:	2,900 pounds
Howard Ave. Plant:	2,200 pounds

- 2) The estimated requirements for Hydrofluorosilicic Acid as listed above, will vary with the actual demands of the City.
- 3) The estimated requirements are given for informational purpose only and shall not be deemed to guarantee either a minimum amount or restrict the maximum amount to be furnished.
- 4) It is the intent of this agreement to require the vendor to furnish ALL the Milwaukee Water Work's Hydrofluorosilicic Acid requirements.
- 5) Neither an under run, regardless of extent, nor an overrun, regardless of extent, in the actual quality delivered compared to the estimated quantity shall entitle the Vendor to an adjustment in the unit price, nor any other compensation.

II. CERTIFICATION BY MANUFACTURER:

- A) It shall be the Vendor's responsibility to perform all tests and inspections required by this specification and to identify the source of the submitted chemical and physical compositions. The contractor shall submit to the City on a quarterly basis the manufacturer's certified test report showing the Hydrofluorosilicic Acid meets each of the physical and chemical requirements in the specification and the latest AWWA Standard B703-06. The testing methods shall conform to applicable ASTM, Food Chemicals Codex, and Water Chemicals Codex methods.
- B) **A Certificate of Analysis shall be submitted for each Hydrofluorosilicic Acid delivery to the city. The certificate must be delivered with the shipment or faxed before unloading begins.** This report shall contain the following:
 - 1) Production lot number
 - 2) Percent by weight active ingredient
 - 3) Specific Gravity
 - 4) Date of analysis
 - 5) Date of Manufacture
- C) The City will accept no deliveries unless accompanied by said certificate of analysis for the specific batch or lot of chemical delivered and the quality specifications are met.
- D) Charges for the certificate of Analysis shall be included in the bid price.
- E) Failure to supply the required Certificate of Analysis shall be sufficient cause for rejection of the load.

III. INSPECTION BY MILWAUKEE WATER WORKS:

- A) The Superintendent of Milwaukee Water Works or a duly authorized representative reserves the right to perform any of the tests and inspections are needed to further determine compliance with this specification.
- B) Samples: The City of Milwaukee reserves the right to sample and test each shipment upon delivery and to reject shipments that do not conform to these specifications. Hydrofluorosilicic Acid not meeting the specifications will be returned to the supplier at supplier's expense.
- C) The Hydrofluorosilicic Acid furnished under this specification will be sampled and tested in accordance with ASTM and Food Chemicals Codex methods.
- D) Rejection: If the Product in any delivery fails to meet the requirements of this specification, the entire contents of the delivery will be rejected and the cause for rejection stated. If the Vendor desires a retest, he shall notify the Purchasing Agent within three (3) days. A portion of the sample taken by the City will then be forwarded for a retest at a laboratory agreed upon by both parties. The results of the retest shall be accepted as final. All expenses attached to the retest shall be borne by the Vendor. Product rejected shall be removed by the Vendor immediately when so ordered by the Purchasing Agent, at the Vendors expense. Any Hydrofluorosilicic Acid found not conforming to this specification would be rejected in accordance with the latest AWWA Standard B703-06.
- E) Hydrofluorosilicic Acid Quality Assurance- The Hydrofluorosilicic Acid supplier shall have the ability to provide periodic Quality Assurance Services. Specifically, the ability to analyze Hydrofluorosilicic Acid for stability, assay (% active ingredient), metals and other parameters related to product integrity.

IV. SUPPLIER SERVICES:

- A) Emergency response – The Hydrofluorosilicic Acid supplier shall provide a list of emergency phone numbers and names of response personnel.
- B) Safety Training - The Hydrofluorosilicic Acid supplier shall provide on-site safety training to customer personnel, contractors, consultants, and other appropriate staff. This training will address chemical and physical properties of Hydrofluorosilicic Acid, personal protective equipment and emergency response procedures. The vendor shall provide a minimum of four (4) sessions, each on different days, of two (2) hours per session of classroom instruction at the City's facility. Safety training will be done during initial startup. Subsequent training can also be done at the customer's request. Additional safety literature, INISIDS, etc. shall be provided to the customer's Safety Department for reference purposes.
- C) The vendor shall provide written instructions regarding the recommended methods for cleaning up the chemical. Such instructions shall include any recommended absorbents or chemicals to be used for neutralization, if applicable, and recommended tests to be performed, such as pH, to ascertain the effectiveness of the neutralization. These instructions are for use by the City staff in cleaning up small spills associated with leaks in pumps, valves, and other appurtenances.

DELIVERY INFORMATION FORM FOR MILWAUKEE WATER WORKS

LINNWOOD WATER PLANT
3000 N LINCOLN MEMORIAL DRIVE
MILWAUKEE, WI. 53211
(414) 286-2880
FAX (414) 286-8653

HOWARD WATER PLANT
3929 S. 6TH STREET
MILWAUKEE, WI 53221
414-286-2890
FAX (414) 286-8005

PRODUCT (COMMODITY): _____

DATE OF DELIVERY: _____

DELIVERY COMPANY (CARRIER): _____

DRIVER NAME: _____

PASSENGER NAME (IF APPLICABLE) _____

TRACTOR (TRUCK) NUMBER: _____

TRAILER NUMBER: _____

ESTIMATED TIME OF ARRIVAL (ETA): _____

NOTE:

THE ABOVE INFORMATION SHOULD BE FAXED TO THE PLANT AT THE NUMBER ABOVE
24 HOURS BEFORE ANTICIPATED DELIVERY TIME.

ANY INCORRECT INFORMATION STATED ABOVE WILL DELAY OR DENY PLANT ACCESS.

DRIVER (AND ANY PASSENGERS) MUST PROVIDE A VALID PHOTO ID TO THE
SECURITY OFFICER BEFORE ALLOWED ENTRY